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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/828,924	04/10/2001	Baozong Zhao	1781-0221P	6648

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EXAMINER

VJAYAKUMAR, KALLAMBELLA M

ART UNIT	PAPER NUMBER
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1751

DATE MAILED: 11/04/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicati n N .

09/828,924

Applicant(s)

ZHAO ET AL.

Examiner

Kallambella Vijayakumar

Art Unit

1751

-- The MAILING DATE of this c mmunication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE ____ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Amendment filed 08/20/2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 and 10-28 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-8, 10-21 and 23-28 is/are rejected.
- 7) ☒ Claim(s) 16 and 22 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 April 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☒ Interview Summary (PTO-413) Paper No(s). 9.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

Detailed Action

- Acknowledge the Amendment under 37 CFR 1.111 filed in Paper-8 on 08/20/2003, and addition of Claims 27 and 28. Claims 1-8 and 10-28 are currently pending with the application.
- Claim Objections in Paper- 7 have been withdrawn except for Claim-22.
- Claim Rejections under 35 USC 112 in Paper- 7 have been withdrawn except for those claims cited in this Paper.
- Negotiations with the Mark J. Nuell to condition the application for the allowance did not materialize.

Claim Objections

- Claims 16 objected to because of the following informalities: As dependent upon the rejected base claim/s.

Claims 16 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action in Paper-7 and to include all of the limitations of the base claim and any intervening claims.

Claim Rejection Under USC 112

- Claim 16 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 16 as amended recites the limitation of “capable of exhibiting electrical conductivity” that is not described by the claims, and specification does not provide guidance on what materials are included by this phrase, except for aniline and pyrrole and their derivatives, and what value of conductivity meets the limitation of being “electrically conductive” although the resistance value for high conductivity being in the range of 10^6 to 10^{10} ohm/sq (Specification, Page 3, Lines 12-23), and public will not be appeased about the boundaries of the limitations of the instant claims by the applicants.

Claim Rejections 35 USC 102**Claim Rejections 35 USC 103**

The arguments by the applicants in response to Office Action in Paper-7, dated 05/20/2003 were given due consideration and careful evaluation, and found to be not persuasive to overcome the rejections. The arguments by the applicants claim that the materials and the method meeting instant claim limitations to be distinct from the prior art are not persuasive and the office maintains the following rejections.

- Claims 1, 8, 10-15, 17-18, 21 and 26-28 rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Natsuko et al (JP 301828).

The office maintains this rejection for the reasons given in Paper-X and the following reasons:

The instant claim-1 recites a limitation of “a polymeric material capable of exhibiting electrical conductivity, the polymeric material being rendered electrically conductive by treatment with a viologen salt”, and the specification does not provide any examples of polymers other than electrically conductive polyaniline/polypyrrole with viologens, and the treatment involves simple dipping of the polymer in the viologen salt solution. The applicants further claim their polymer to be distinctly different from the prior art in retaining electrical conductivity after washing away the viologen salt, which is not the limitation of the instant claim/s. Further, specification mentions about removing the viologen by blotting and not the removal by washing which are two different processes.

Besides, all the examples of polymers in the Paper by Zhuo et al (Synthetic Metals 123, 263, 2001) deal with treating the electrically conductive polyaniline with the viologen salt. The applicants argue that Natsuko et al fill the pores of a porous polymer film with an electrolyte of viologen and the resultant conductivity is due to viologen. The applicants do not provide any evidence in support of their interpretation of Natsuko's Polymer.

It is the position of the office that neither the porosity nor the mechanism of imparting electrical conductivity to the polymer is the limitation of instant claims by the applicants, while the treating the polymer film with the viologen or viologen dihalide solution by Natsuko et al, that is the same electrochrome claimed in the instant claims by the applicants, and this would meet the limitation of “treating” the polymeric material and the resultant electrical conductivity of the polymer films meets the limitation of “rendering electrical conductivity” to the polymeric material in Claim-1 and “contacting a surface of a polymeric material” in Claim-18.

The doping of the red-ox active polymers such as polyaniline by red-ox viologens, by contacting the materials followed by exposure to heat/radiation, and the resultant changes in the electrical conductivity of the product would be anticipated, because of several types of

interactions between the polyaniline and viologen/electrolytes that are known in the prior art (See. Sammels et al, used in other rejection, US Patent # 4,750,817, Col-2, Lines: 39-46), and the participation of viologens in the aggregate conductivity of the resultant polymer would inherently alter its conductivity. During patent examination, the pending claims must be “given their broadest reasonable interpretation consistent with the specification.” In re Hyatt, 211 F.3d 1367, 1372, 54 USPQ2d 1664, 1667 (Fed. Cir. 2000). MPEP 2111.

- Claims 1, 8, 15, 18 and 26 rejected under 35 USC 102(b) as anticipated by or under USC 103(a) as obvious over Kumiko et al (JP 06-102540).

The office maintains this rejection for the reasons given in Office Action in Paper-X and for the reasons given under Natsuko et al as above.

- Claims 1, 8 and 15 rejected under 35 USC 102(b) as anticipated by or under USC 103 as obvious over Sammels et al (US Patent 4,750, 817).

The office maintains this rejection for the reasons given in Paper-X and the following reasons:

Applicants argue that Sammels polymer is an ion-exchange resin in contact with an electrolyte. Sammels discloses an electrochemical cell wherein an ionically conducting polymer selected from a group of many preferred polymers that include resins which are not ion-exchange resins as alleged by the applicants, and the polymers being in contact with electrolyte containing red-ox viologens such as alkyl viologens, that meets the limitation of “contact” in Claim-18 and “treatment” in Claim-1, and the electrical conductivity rendered to the polymer by viologen would be inherent. Sammels further discloses the use of alkyl viologens, ethyl viologen, benzylviologen and heptyl viologen dibromide in the photoelectrochemical cells, and various modes of interactions between viologens and the polymers (Col-2. Lines: 12-46) that would impart improved electrode performance (Examples 1-2) and the modification of the electrical conductivity of the base polymer would be inherent due to doping.

- Claims 1, 8, 10-15, 17-18 21 and 26 rejected under 35 USC 102(b) as anticipated by or under USC 103(a) as obvious over Allemand et al (US 5,989,717).

The office maintains this rejection for the reasons given in Paper-X and the following reasons:

Allemand et al use polyaniline and polypyrroles as ion conducting polymers in electrochromic cells, the same polymers claimed by the applicants in the claims and disclosure in specification, and the polymer being in contact with the electrolyte containing viologens, the same red-ox electrochrome being claimed by the applicants to treat the polymers to render them electrically conductive. Allemand attains the desired oxidation state of polyaniline in the cell, which meets the limitation of instant claims 7 and 19. The several modes of interaction between the viologens and polymers are known in the art as shown by Sammels et al as above, and the electrical conductivity modification of a polymer upon contacting with viologens would be inherent.

- Claims 1-8, 10-15, 17-21 and 23-26 are rejected under USC 103(a) as obvious over Sammels (US 4,750,817 or Allemand et al (US 5,989,717) in view of Yu et al (US Patent 5,471, 338).

The office maintains this rejection for the reasons given in paper-X and the reasons given under Natsuko et al, Sammels and Allemand et al as above. Yu teaches the use of polyaniline and dihalides of viologens as electrochromic materials in the analogous art.

- Claims 1-6, 8, 10-15, 17-21, 23-24 and 26 are rejected under USC 103(a) as obvious over Natsuko et al (JP 07-301828) in view of Hidetsugu et al (JP 01-230691) or Seikushi (JP 03-152183).

The office maintains this rejection for the reasons given in Paper-X and reasons given under Natsuko as above.

Allowable Subject Matter

Claims 16 would be allowable upon overcoming the rejection under 35 USC 112 –II paragraph and for the reasons given in Paper-7.

Claim 22 would be allowable upon overcoming rejection under USC 112 II paragraph and for the reasons given in Paper-7.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

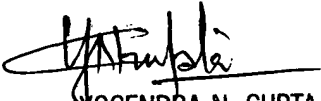
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kallambella Vijayakumar whose telephone number is 703-305-4931. The examiner can normally be reached on M-Th, 07.30 - 17.00 hrs, Alt. Fri: 07.30-16.00 hrs.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. Yogendra Gupta can be reached on 703-308-4708. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

KMV
November 3, 2003.


YOGENDRA N. GUPTA
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700